Saskatchewan
Labour
Occupational Health
and Safety

Guidelines for Latex and Other Gloves

The concern

The use of latex gloves in health care has risen as workers have become more aware of the need for barrier protection against bloodborne pathogens and universal precautions were adopted. Universal precautions call for the use of gloves to prevent contact with any "bloody body fluids." Latex gloves have been the most commonly used glove type, partly because latex was regarded as providing better barrier protection than vinyl or other gloves.

Along with the increasing usage of latex gloves, there have been a rising number of reports of allergic reactions to latex, including some severe, immediate reactions. The more immediate reactions range from hives, runny nose and asthma to full intolerance of the gloves (e.g., a serious lowering of blood pressure and potentially anaphylactic shock).

What causes these reactions?

Latex is a natural product, collected and concentrated from certain trees. The concentrated rubber latex is treated with additives in manufacturing latex gloves. The gloves are soaked in water to remove proteins present in latex, but some proteins remain in the final product.

The proteins and additives can cause the skin reactions. They can also be adsorbed through the powders used in gloves. The proteins are thought to be responsible for the more severe, immediate reactions to the gloves. Persons allergic to additives in latex gloves can react to these chemicals in other natural rubber and non-rubber products, such as plastics, pesticides, oils, adhesives, bandages, tape and organic dyes.

What are the reactions associated with the use of latex gloves?

- Dermatitis
- Contact urticaria/systemic reactions
- Anaphylactic reactions

Dermatitis

Latex is a cause of irritant and allergic contact dermatitis.

Irritant Dermatitis on the hands is recognized by dry, flaky skin with papules, cracks or sores. It is caused by hand exposure to certain chemicals that penetrate the outer layers of the skin. Irritants that penetrate this layer can remove fat from the skin or can react with substances in the underlying tissues. These reactions result in inflammation and damage to tissues.

The following factors contribute to irritation from gloves:

- substances that contaminate the inside of the gloves (e.g., soaps, disinfectants) or that penetrate the gloves themselves (e.g., glutaraldehyde)
- sweat accumulated inside the glove
- frequent use of gloves
- frequent hand-washing
- chafing by the glove

Allergic Contact Dermatitis usually takes 48 to 96 hours from the time of exposure for the symptoms to develop. It is recognized by dry, red, crusted and thickened skin with hard bumps, sores and sometimes blisters. This condition is caused by exposure to additives in latex gloves that react with specific proteins and cells of the body. These reactions result in the release of substances that irritate and damage tissues.

Possible allergy-causing additives include accelerators (especially **thiurams and carbamates**), anti-oxidants, anti-microbials, emulsifiers and dispersing agents, colourants and stiffeners.

Contact urticaria/systemic reactions

A worker may experience discomfort, itching and develop hives (urticaria) within five to 60 minutes after donning latex gloves.

Exposure to airborne, protein-containing powders from the gloves can result in red, itchy eyes, swollen eyelids, runny nose, shortness of breath, asthma, dizziness and rapid heartbeat (tachycardia). If the gloves are removed, the symptoms may subside without treatment within a period of 30 minutes to two hours.

Anaphylactic reactions

Rare, life-threatening, anaphylactic reactions have been reported after mucous membrane or inhalation exposure to latex products. In addition to the above symptoms, exposures involve a lowering of blood pressure.

Although in rare situations, workers have had severe anaphylactic reactions while donning powdered latex gloves, there have not been any deaths reported from occupational exposure to latex.

Deaths resulting from anaphylaxis after exposure to latex products have occurred in patients who had direct, mucous membrane contact with latex products.

Who is at risk?

- Workers with frequent or prolonged use of disposable latex gloves are more likely to develop latex allergy, especially if they have damaged skin.

- Physicians, dentists, nurses, laboratory, dental and other health care workers who are regular users of disposable examination or surgical latex rubber gloves are at a higher risk. The prevalence of latex allergy among these workers, according to published reports, is three to 17%.

- Workers who wear multiple-use latex gloves for barrier protection against chemical substances (and dishwashing detergents) are also at some risk of developing latex allergies.

- Workers with pre-existing hand dermatitis are more prone to developing latex allergy.

- Workers in areas where powdered latex gloves are used are likely to be exposed to more latex proteins that cause many of the allergic reactions.

- Workers with personal histories of allergy seem to be at increased risk of developing latex allergies. Persons who have allergic reactions to one or more of a wide variety of fruits (bananas, kiwis and other), some vegetables (such as potatoes and carrots) and other foods (such as chestnuts) may cross-react to substances in latex gloves.

Checklists are available to assist workers in assessing their susceptibility to a latex allergic reaction. (Examples of these can be found in the various internet resources on latex allergy listed on Page 14).

How can an employer reduce a worker's risk of developing a latex allergy?

- Develop a policy for glove use
- Educate and train workers
- Develop a procedure to deal with suspect cases

Employers must monitor latex glove use and assess the risk to workers from exposure to the proteins and additives in the gloves, and develop procedures that:

- reduce workers' unnecessary use of powdered latex gloves (for example where alternatives provide sufficient barrier protection or where gloves are not needed); and
- to the extent that is reasonably practicable, limit worker exposure to protein-containing powders released from latex gloves.

These requirements can be achieved by developing and implementing a workplace policy for glove use.

Develop a policy for glove use

Examine procedures used throughout the facility and determine the appropriateness of glove usage. For each type of procedure, determine whether gloves are needed and what glove material is recommended. Consult with the Occupational Health Committee and staff representatives from all areas and job types. Review and revise the policy on a regular basis to address new procedures or changes to existing procedures. Use the following principles in developing the overall glove use policy.

Assess need for gloves

- To provide barrier protection against infectious diseases, current Health Canada guidelines call for medical gloves made of latex, vinyl, nitrile, neoprene, copolymer or polyethylene:

  (i) if exposure to blood and body fluids capable of transmitting bloodborne infection is anticipated;

(ii) if exposure to potentially infectious material such as pus, feces, respiratory secretions or exudate of skin lesions is anticipated; and

(iii) when the health care worker has non-intact skin on his or her hands.

- Gloves are not required for routine patient care activities if contact is limited to a patient's intact skin (e.g. transferring a patient) and may not be needed for routine diaper changes, if this can be done without contaminating the hands with stool or urine.

- Sterile gloves are required for procedures in which the hands or handled instruments are entering a sterile body cavity or tissue.

Use appropriate gloves

- Choose a medical glove type considering its barrier protection and its potential allergenicity. In addition to latex, other glove materials have been tested and shown to provide acceptable barrier protection against viruses and other microorganisms. These glove materials are not known to cause the severe allergic reactions that latex has.

- Consider non-latex gloves for procedures not likely to involve exposure to bloody body fluids.

- The use of vinyl gloves should be restricted to short tasks or tasks in which there is minimal stress to the glove material.

- When procedures call for latex gloves, make non-powdered, low protein latex gloves the standard. Provide powdered, low protein latex gloves only when their use can be adequately justified (for example, where non-powdered gloves interfere with the speed of a procedure). Carefully monitor the use of powdered latex gloves.

- Disposable gloves of any material are not recommended for housekeeping activities, instrument cleaning and decontamination procedures. General purpose, reusable rubber, butyl or neoprene gloves are suitable.

- Double gloving may be used for some procedures where there is a greater chance of percutaneous (skin puncture) injuries.

- When choosing gloves for barrier protection against *chemical* substances, there are often alternatives to latex gloves (e.g., nitrile) that provide equivalent barrier protection. Check the material safety data sheet for the substance and use chemical compatibility charts available from the glove suppliers.

- Gloves may need to be changed before punctures or tears develop during lengthy procedures.

Buying gloves

- New regulations (the Medical Devices Regulations) require that all medical glove brands sold in Canada be licensed to verify that they meet the mandatory quality standards of Health Canada[1] or equivalent standards (for example, ISO 11193 or ASTM D3678-00). Licensed gloves that meet appropriate standards have demonstrated sufficient barrier protection against bloodborne pathogens.

  Ask the supplier for a copy of the glove brand licensing letter. If the supplier has not yet received the licensing letter, ask for a letter attesting:

  - That the gloves have been tested and met the prescribed minimum quality requirements; and

  - Are in the process of being licensed

  Packages of disposable medical gloves that carry the Canadian General Standards Board (CGSB) symbol have been tested by CGSB and demonstrated sufficient barrier protection.

- Any disposable medical latex gloves carrying the CGSB symbol and marked "powder-free" have less than 5 mg of powder/glove (by 2002 this amount will be reduced to 2 mg of powder/glove). Gloves that have more than this amount must be labeled as "powdered".

- Disposable powdered medical latex gloves that carry the CGSB symbol have less than 250 µg protein/g of glove. Any disposable "powder-free" medical latex gloves carrying the CGSB symbol have less than 50 µg protein/g of glove.

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[1] As described in the *Policy on Medical Gloves* produced by and available from the Therapeutic Products Program of Health Canada (1-800-267-9675)

- Buy a non-powdered brand that has the lowest protein content. The protein content, expressed as μg protein/g (microgram protein per gram) of the glove material can vary one thousand fold from one brand to the other. This ranges from as low as 1 μg/g to around 1200 μg/g. Although no standard or "safe" level of protein content has been established, it is advisable to choose gloves with the least amount of protein.

- Check with the supplier for the protein content of the gloves and the method of its determination. Protein contents can be directly compared when the same method of determination is used. If you need assistance in comparing protein content among various suppliers or for the protein content of selected brands of medical gloves, contact Health Canada's Therapeutic Products Program at (1-800-267-9675).

- Do not rely solely on claims or advertisements that the product is a "hypoallergenic glove". It is possible that these gloves may contain more of a particular allergen than a non-hypoallergenic glove. "Hypo-allergenic" gloves may be latex gloves with fewer additives; lower levels of proteins; no powder; or with non-latex inner linings.

  "Hypo-allergenic" may also refer to non-latex gloves. Specific information about a particular additive should be obtained from the glove supplier.

Other considerations

- The policy should discourage the use of expired gloves. Look for an expiry date on individual packages of surgical gloves. Dispose of gloves when they show any sign of leakage or deterioration. The policy should also address glove storage. Gloves should not be stored at extreme temperatures or near ionizing radiation.

- Provide alternative gloves to workers who are at more risk of developing latex allergy. Alternatives include non-powdered latex gloves with low levels of proteins or gloves free of additives to which the worker is known to be allergic.

Educate and train workers

- Once the policy has been developed, the employer must ensure that workers are informed of the health risks associated with latex glove use and trained on the contents of the policy.
- Workers required to wear latex gloves must be informed of the potential reactions associated with direct skin contact with the latex. Exposed workers must be informed about possible reactions from inhaling the powders from latex gloves worn by themselves or others. Advise workers with a history of allergy or existing hand dermatitis that they are at more risk. Encourage these workers to go for regular latex-allergy testing.
- Workers should receive training on:
  - ✓ what procedures require gloves
  - ✓ what glove products contain latex
  - ✓ what glove materials are recommended for a procedure
  - ✓ how to recognize the signs and symptoms of latex allergy
  - ✓ the need to promptly report to the employer possible reactions and changes in the nature and severity of reactions
  - ✓ the need to consult a physician when a latex allergy is suspected (diagnostic tests are available to confirm and characterize latex allergy)
  - ✓ the importance of avoiding the use of lotions or barrier creams under the gloves. (such materials can react with the latex or compromise the integrity of the gloves)
  - ✓ the importance of alerting coworkers when a latex allergy is suspected
  - ✓ procedures for dealing with suspected cases and procedural and product changes that will occur where a latex allergy is confirmed

Develop a procedure to deal with suspect cases

Develop a procedure to deal with cases of suspected latex allergy that specifies the employer's responsibility. The procedure should include the timely reporting, evaluation and response to all suspected latex reactions. In advance, prepare a listing of all products that contain latex material, which a worker could be exposed to. Prepare a list of non-latex substitutes. Keep the lists up-to-date.

The regulations require the employer to take additional steps to minimize the exposure of a sensitized worker to a substance that causes the sensitivity reaction. These steps should include:

- Encouraging the worker to visit their physician for a medical confirmation and evaluation of the nature and extent of their allergy. It is important to determine if they have the potential for severe allergic reactions to latex. Medical specialists can determine whether the person has latex-specific IgE antibodies that are associated with severe reactions. Encourage the worker to provide the employer with any needed medical information on the nature and severity of their latex allergy.

- Providing non-latex gloves to workers with latex allergies.

- Requiring other workers to use non-powdered latex gloves or latex alternatives in work areas where a worker has a medically-confirmed latex allergy. Any exception to this must be based on a careful examination of the reasons for using powdered latex gloves. The implications of using powdered latex gloves (for example, the likelihood that the glove may cause a severe allergic reaction) must be considered.

- Informing other workers when a coworker has reported a medically-confirmed latex allergy and notifying them of what procedural changes are needed; encouraging workers (especially workers with severe latex allergies) to inform their coworkers.

- Developing a latex-safe protocol or work area where workers with confirmed, severe latex allergy are expected to work. The objective is to ensure, as far as possible, that the allergic workers are not inadvertently exposed to the latex ingredients that they are sensitized to, such as airborne powders released from latex gloves. This may involve a thorough preliminary cleaning of a work area to remove latex-containing dusts (upholstery, carpets, ventilation ducts, plenums and filters, vacuum cleaners and bags).

- Identifying other known latex products the sensitized worker may be exposed to. Inform sensitized workers of other latex-containing products that may trigger an allergic reaction after direct skin or mucous membrane contact. (See the examples listed at the end of this publication). Consider substituting latex products if their usage puts sensitized workers at risk of severe allergic reactions.

- Offering alternative work duties to the extent that is reasonably possible, to workers who have developed medically-confirmed latex allergies, where their normal work duties involve necessary exposure to latex products. The regulations require the employer, on the request of the worker, to assign the worker to less hazardous, alternate work, if that work is available.

- Encouraging workers with medically-confirmed latex allergies to wear a bracelet identifying a latex allergy, at all times.

What products in the workplace and household environment contain latex?

Note: This list is not exhaustive. Additional items and lists may be found in the Resources.

Emergency and first aid equipment

- Blood pressure cuffs
- Stethoscopes
- Oral and nasal airways
- Endotracheal tubes
- Tourniquets
- Intravenous tubing
- Syringes
- Electrode pads
- Adhesive tape
- Ace bandages

Personal protective equipment

- Gloves
- Surgical masks
- Goggles
- Respirators
- Rubber aprons

Office supplies

- Rubber bands
- Erasers

Hospital and other medical supplies

- Anesthesia masks
- Catheters
- Wound drains
- Injection ports
- Rubber tops of multidose vials
- Dental dams
- Dental bite blocks
- IV tubing

Household products

- Automobile tires
- Motorcycle tires
- Motorcycle and bicycle handgrips
- Carpeting
- Swimming goggles
- Racquet handles and golf grips
- Shoe soles
- Expandable fabric (waistbands)
- Dishwashing gloves
- Hot water bottles
- Condoms
- Diaphragms
- Balloons
- Pacifiers
- Baby bottle nipples and pacifiers
- Teething rings
- Rubber balls
- Belts
- Brassieres
- Carpet backing
- Rubber cement
- Suspenders
- Erasers
- Foam pillows
- Garden hoses
- Shoewear
- Weather stripping

Resources

- Guidelines for the Management of Latex Allergies and Safe Latex Use in Healthcare Facilities. Sussman, G. and Gold, M. Canadian Healthcare Association. Ottawa Ontario. 1996.
- Preventing Allergic Reactions to Natural Rubber latex in the Workplace. NIOSH Alert. DHHS (NIOS) Publication No. 97-135.
- Latex Information Pamphlet. The Saskatchewan Union of Nurses. Phone 1-800-667-7060 (Regina) or 1-800-667-3294 (Saskatoon).
- Canadian Latex Allergy Association, 96 Cavan Street, Port Hope Ontario L1A 3B7. Phone (905) 885-9708 or (905) 885-5270.
- Policy on Medical Gloves. The Therapeutic Products Program of Health Canada. Phone 1-800-267-9675.

Internet resources

- The National Institute for Occupational Safety and Health Home Page: www.cdc.gov/niosh/homepage
- Latex Allergy Links: A site maintained by ELASTIC, the Education for Latex Allergy/Support Team and Information Coalition. A comprehensive collection of some of the latest articles on latex allergies. Includes links to related sites: http://pw2.netcom.com/~nam1/latex_allergy.html
- Latex Allergy Links: Health Canada: http://home.netcom.com/~nam1/latex_allergy/hc.html
- Canadian Latex Allergy Association: http://members.tripod.com/claa/
- Latex Allergy Resources: http://www.edae.gr/allergy.html
- Occupational Safety and Health Association (OSHA) Resources on Latex Allergies: http://www.osha-slc.gov/SLTC/latexallergy/index.html

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